

Serial No. 09/578,511
Amdt. dated November 12, 2004
Reply to Office Action of August 12, 2004

Docket No. HI-0004

REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-17, 19-23, 25-33 and 35-42 are pending in the present application. Claims 24 and 34 have been canceled and claims 1, 2, 21, 22, 32 and 42 have been amended by the present amendment.

In the outstanding office action, claims 1, 22, 23, 25-29, 31-33, 35-39, 41 and 42 were rejected under U.S.C. § 103(a) as unpatentable over Chalmers; claims 6-12, 19 and 20 were allowed; and claims 2-5, 24, 30, 34 and 40 were indicated as allowable if rewritten in independent form.

Applicant thanks the Examiner for the indication of allowable subject matter. In light of this indication, claims 22 and 32 have been amended to include the subject matter recited in dependent claims 24 and 34, respectively.

Claims 1, 22, 23, 25-29, 31-33, 35-39, 41 and 42 stand rejected under U.S.C. § 103(a) as unpatentable over Chalmers. This rejection is respectfully traverse.

Independent claim 1 has been amended to include further structure of the analog-to-digital converter. In particular, independent claim 1 recites that the analog-to-digital converter device includes a quantizer to convert the intermediate frequency signal into the digital signal, a latch circuit to receive the digital signal and output first and second signals in which the second signal is a

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delayed first signal, and an output formatter to receive the first and second signals and output the first and second signals at prescribed periods to produce the quadature component and the in-phase component of the digital signal. Independent claim 42 includes similar features in a varying scope.

As discussed in the previous responses, the present invention includes an analog-to-digital converter device to convert an intermediate frequency signal into a digital signal and to provide a quadature component and an in-phase of the digital signal. Thus, because the analog-to-digital converter simultaneously performs QPSK demodulation and analog-to-digital conversion, the number of circuit devices can be reduced and the circuit design can be simplified, resulting in a reduction of the power consumption, a manufacturing cost, as well as the overall size (see page 11, lines 14-17 in the specification).

The Office Action recognizes Chalmers fails to disclose providing a quaditure and an in-phase component of the digital signal in an A/D converter, but indicates Chalmers shows at the output of the A/D converter the digitized signals separates (308) and provides an in-phase component (310) and a quadature component (312) of the digital signal and cites col. 7, lines 41-64. The Office Action then indicates it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the separate digital components outputted at the A/D converter device in such a way (in a single chip) so as to provide similarity of function as taught by Chalmers.

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However, it is respectfully noted there is no motivation provided in Chalmers for combining the A/D converter and down converter/despreaders IC408 into a single chip. Further, even if one was to combine the two devices, there is no teaching in Chalmers et al. about the type of structure required.

On the contrary, independent claims 1 and 42 recite a specific structure of the analog-to-digital converter including the quantizer, latch circuit and output formatter shown in a non-limiting example of Figures 2 and 3, for example. This specific structure allows the claimed D/A converting to convert the intermediate signal into a digital signal and to provide the claimed I and Q components. Further, it is respectfully noted the features of the latch circuit and output format are also recited in dependent claim 14, which was previously indicated as allowable. Note that independent claims 1 and 42 do not include all of the elements of independent claim 10, which claim 14 depends on. However, it is respectfully submitted independent claims 1 and 42 includes specific elements which are not disclosed in Chalmers.

Similar arguments apply to the rejection of claims 21 under U.S.C. § 103(a) as unpatentable over Efstathiou.

Accordingly, it is respectfully submitted independent claims 1, 21 and 42 and each claims depending there from are allowable.

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CONCLUSION

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. If the Examiner believes that any additional changes would place the application in better condition for allowance, the Examiner is invited to contact the undersigned attorney, **David A. Bilodeau**, at the telephone number listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
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